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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,310	01/22/2002	Hamid Noorbakhsh	4150D1/ETCH/DRIE/JB1	9294

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APPLIED MATERIALS, INC.  
2881 SCOTT BLVD. M/S 2061  
SANTA CLARA, CA 95050

EXAMINER
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ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

<b>Office Action Summary</b>	Application No. 10/055,310	Applicant(s) NOORBAKHS ET AL.	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/3/04 has been entered.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 37 is rejected under 35 U.S.C. 102(a) as being anticipated by Pu et al, WO 99/48130.

Pu et al. discloses a center member 10 having a first side adapted to be exposed to the processing region and coupled to end of the cylindrical wall; and a passage at least partially disposed in the center member, having an inlet and an outlet adapted to circulate a fluid through the passage wherein the passage is fluidly isolated from the processing volume (see page 11, lines 16-28 and fig. 1 and its description).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10 connected to and extending upward from an inner side of the base; a passage 23 in the inner wall having an inlet and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of

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member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Shan et al. fails to expressly disclose a substantially annular passage formed in the base or center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Lee discloses using an annular heat medium passage (123,129) formed so as to prevent deposition on the surfaces exposed to plasma (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to control the temperature of the surfaces exposed to the gases (plasma) because this will prevent the deposition of by-products on the exposed walls.

With respect to claim 36, note that Shan et al. further discloses that the cylindrical inner wall and the center member comprise a single piece structure.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208 as applied to

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claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Shan et al. and Lee are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Lee as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Shan et al. and Lee are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Shan et al. modified by Lee in order to provide connection for the supply and removal of the heat exchanging medium.

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Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al. and Lee are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Lee as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10 and connected and extending upward from an inner side of the base; a passage 23 in the inner wall having an inlet and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the

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center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Shan et al. fails to expressly disclose a substantially annular passage formed in the base, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Masuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the sidewall 102. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. by supplying a heat transfer medium through the liner because this allows for the formation of a strong polymerized film on the exposed walls.

With respect to claim 36, note that Shan et al. further discloses that the cylindrical inner wall and the center member comprise a single piece structure.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Collins et al., EP 0 807 953 A1.



Shan et al. and Masuda et al. are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Shan et al. and Masuda et al. are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Shan et al. modified by Masuda et al. in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Masuda et al., U.S. Patent 6,171,438 as

applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, and 33-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al. and Masuda et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 7-10 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 in view of Miyamoto, U.S. Patent 5,846,331.

Shan et al. shows the invention as claimed including: an aluminum base 22; a removable cylindrical inner wall/liner 10; a passage 23 in the inner wall having an inlet and an outlet; an outer wall 20 comprising a pumping port 50; a center member (top center part of member 10); a flange (top outer part of member 10); wherein the inner wall is cylindrical and projects from the center member inside of the flange and a passage disposed in the center member having an inlet and an outlet (see fig. 1); a lid 24 disposed opposite the cylindrical wall, the lid and the wall defining a plenum at least

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partially therebetween (see fig. 1); a plurality of nozzles disposed in the center member providing fluid access to the plenum; a gas feedthrough fluidly coupled to the plenum through a hole disposed in the lid (see page 4, lines 25-27). For a complete description of the apparatus see fig. 1, page 3-line 20 to page 4-line 45, and page 9, lines 7-46.

Shan et al. fails to expressly disclose a substantially annular passage formed in the center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Miyamoto discloses forming a substantially annular passage 5 in a center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, where the passage is isolated from the processing volume (see fig. 2 and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to include the annular passage of Miyamoto because this will allow for controllability of the temperature of the upper portion of the chamber.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130.

Pu et al. is applied as above, and further discloses a cylindrical liner section adapted to line at least a portion of the walls of the processing chamber and coupled to the center member, but, does not expressly disclose that the cylindrical section and the center member comprise a single piece structure. However, making elements integral

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was held to have been obvious, and such limitation would not lend patentability to the instant application absent the showing of unexpected results.

Claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438.

Pu et al. shows the invention as claimed including: an aluminum base 14; a removable cylindrical inner wall/liner 26 and connected to and extending upward from an inner side of the base; a gas passage in the inner wall having an inlet and an outlet (see page 5, lines 10-11); an outer wall 12 comprising a pumping port 24. For a complete description of the apparatus see fig. 1, page 4-line 14 to page 5-line 11 and page 11, lines 16-28).

Pu et al. fails to expressly disclose a substantially annular passage formed in the base or center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Masuda et al. discloses an apparatus comprising a liner 103 having a heat exchanging medium supply means 104 to control the temperature of the side wall 102. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. by supplying a heat transfer medium through the liner because this allows for the formation of a strong polymerized film on the exposed walls.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Pu et al. and Masuda et al. are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Masuda et al. as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Pu et al. and Masuda et al. are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Pu et al. modified by Masuda et al. in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Pu et al. and Matsuda et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Masuda et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 7-10 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Shan et al., EP 0 814 495.

Pu et al. is applied as above but does not expressly disclose the claimed structural limitations. Shan et al. discloses an apparatus having a center member being circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-

line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

Claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208.

Pu et al. shows the invention as claimed including: an aluminum base 14; a removable cylindrical inner wall/liner 26 and connected to and extending upward from an inner side of the base; a gas passage in the inner wall having an inlet and an outlet (see page 5, lines 10-11); an outer wall 12 comprising a pumping port 24. For a complete description of the apparatus see fig. 1, page 4-line 14 to page 5-line 11 and page 11, lines 16-28).

Pu et al. fails to expressly disclose a substantially annular passage formed in the base or center member, and having an inlet and an outlet adapted to circulate a fluid through the passage, wherein the passage is fluidly isolated from the processing volume. Lee discloses using an annular heat medium passage (123,129) formed so as to prevent deposition on the exposed surfaces of the chamber (see fig. 1 and its description). In view of this disclosure, it would have been obvious to one of ordinary

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skill in the art at the time the invention was made to modify the apparatus of Pu et al. so as to control the temperature of the surfaces of the chamber exposed to the chamber gases because this will prevent the deposition of by-products on the exposed walls.

Claims 4 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35, and 38-39 above, and further in view of Collins et al., EP 0 807 953 A1.

Pu et al. and Lee are applied as above but does not expressly disclose a magnet disposed in the inner wall. Collins et al. discloses the use of magnets 80/82 in walls of the apparatus for plasma confinement. In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Lee as to further comprise a magnet disposed in the inner wall in order to confine the plasma.

Claims 6, 13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35 and 38-39 above, and further in view of Reimold et al., DE 31 10489 A1.

Pu et al. and Lee are applied as above but do not expressly disclose the use of bosses. Reimold discloses the use of bosses for providing connection for the supply or the removal of a heat exchanging medium (see equivalent abstract). Therefore, in view



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of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use bosses in the apparatus of Pu et al. modified by Lee in order to provide connection for the supply and removal of the heat exchanging medium.

Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Lee, U.S. Patent 5,616,208 as applied to claims 1-3, 5, 11-12, 14-17, 20-23, 25-26, 28-31, 33-35 and 38-39 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Pu et al. and Lee are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Lee as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claims 7-10 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Shan et al., EP 0 814 495.

Pu et al. is applied as above but does not expressly disclose the claimed structural limitations. Shan et al. discloses an apparatus having a center member being

circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

### ***Response to Arguments***

Applicant's arguments filed 12/15/03 have been fully considered but they are not persuasive.

Applicant argues with respect to claims 1-3 and 5 that the combination of Shan et al. and Lee is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, as broadly interpreted, Shan et al. does disclose a passage in the inner liner wall, as stated by the examiner (see fig. 1). While this can be considered a passage as pointed out by the examiner, the passage being relied upon by the examiner to show the inlet and outlet adapted to circulate a fluid through as

required by independent claim 1 is shown and described in the secondary reference of Lee. Moreover, the secondary reference of Lee provides motivation to modify Shan et al. so as to control the temperatures exposed to the gases (plasma). Since the apparatus of Shan is cylindrical, it follows that the passages would need to be annular to cover the exposed surfaces. Concerning applicant's statement that neither Shan et al. or Lee teach liners, it is clear in fig. 1 that a liner covers the walls of the apparatus, and therefore it would be necessary to control the temperature of this liner since it is the object exposed to the plasma.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Shan et al. or Lee do not teach, show or suggest preventing deposition on the liner) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Concerning claims 11-12, 14-17, and 20-23, applicant argues that both Shan and Lee fail to suggest a chamber liner adapted to be removably disposed in a processing region and having a base for substantially covering the bottom of the processing chamber and a passage formed at least partially in the base. As for the liner being removable, it appears from Shan that the liner in the primary reference is removable via a variety of fasteners (see fig. 1). Furthermore, motivation was provided previously for forming a passage in the surfaces exposed to the gases (plasma) within the chamber.

Regarding applicant's argument that Shan et al. or Lee do not teach, show or suggest a chamber liner having a center member, it should be noted that, as stated in the rejection, the primary reference of Shan et al. does disclose a center member.

Concerning claim 4, applicant argues that the references fail to show or render unobvious the limitation of "a magnet disposed in the inner wall". The examiner respectfully submits that a broad reasonable interpretation of the meaning of "inner wall" is clearly met by the Collins '953 reference. Regarding the fact that Collins '953 fails to teach a magnet disposed within the inner liner, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Collins into the Shan et al. and Lee references is, for example, in order to confine the plasma thereby attaining better controllability. Additionally, there is clearly support for claim 19 because in Collins the magnets are located near the pumping port to confine the plasma (see fig. 1) and in fig. 1 of Shan et al. the region near the pumping port has lips extending into the processing chamber so it would have been obvious to modify the apparatus of Shan to insert the magnets in this lip portion.

With respect to rejections involving the Reimold et al. reference, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Concerning the rejection of claim 24 using the Banholzer reference, applicant argues that Banholzer teaches away from the Lee reference. However, the Lee reference is relied upon to show temperature control of the portions of the liner exposed to the plasma and therefore the rejection is still proper.

Applicant argues with respect to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, and 28-31, that the combination of Shan et al. in view of Masuda et al. is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA

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1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Furthermore, the base for covering the bottom of the processing chamber is shown by Shan et al. and the motivation for forming the passage in the base is provided by Masuda et al. for the reasons in the above rejection and therefore the rejection is respectfully maintained.

Concerning claims 11-12, 14-17, and 20-23, applicant argues that both Shan et al. and Masuda et al. fail to suggest a chamber liner adapted to be removably disposed in a processing region and having a base for substantially covering the bottom of the processing chamber and a passage formed at least partially in the base. As for the liner being removable, it appears from Shan that the liner in the primary reference is removable via a variety of fasteners (see fig. 1). Furthermore, motivation was provided previously for forming a passage in the surfaces exposed to the gases (plasma) within the chamber.

Regarding applicant's argument that Shan et al. or Masuda et al. do not teach, show or suggest a chamber liner having a center member, it should be noted that, as stated in the rejection, the primary reference of Shan et al. does disclose a center member.

Concerning claim 4, applicant argues that the Shan et al. and Masuda et al. references fail to show or render unobvious the limitation of "a magnet disposed in the inner wall". The examiner respectfully submits that a broad reasonable interpretation of the meaning of "inner wall" is clearly met by the Collins '953 reference. Regarding the fact that Collins '953 fails to teach a magnet disposed within the inner liner, it is noted

that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Collins into the Shan et al. and Masuda et al. references is, for example, in order to confine the plasma thereby attaining better controllability. Additionally, there is clearly support for claim 19 because in Collins the magnets are located near the pumping port to confine the plasma (see fig. 1) and in fig. 1 of Shan et al. the region near the pumping port has lips extending into the processing chamber so it would have been obvious to modify the apparatus of Shan to insert the magnets in this lip portion.

With respect to rejections involving the Shan et al., Masuda et al. and Reimold references, and the rejection involving Shan et al., Masuda et al. and Banholzer references, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642

F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues with respect to claims 7-10, and 36-39, that the combination of Shan et al. in view of Miyamoto is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, the liner adjacent the chamber lid is shown by Shan et al. and the motivation for forming the passage in the liner adjacent the chamber lid is provided by Miyamoto for the reasons in the above rejection and therefore the rejection is respectfully maintained. Furthermore, note that the primary reference of Shan et al. does disclose a center member.

Applicant argues with respect to claims 1-3, 5, 7-12, 14-17, 20-23, 25-26, and 28-31, that the combination of Pu et al. in view of Masuda et al. is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, the base for covering the bottom of the processing chamber is shown by Pu et al. and the motivation for forming the passage in the base is provided by Masuda et al. for the reasons in the above rejection and therefore the rejection is respectfully maintained.



Concerning claims 11-12, 14-17, and 20-23, applicant argues that both Pu et al. and Masuda et al. fail to suggest a chamber liner adapted to be removably disposed in a processing region and having a base for substantially covering the bottom of the processing chamber and a passage formed at least partially in the base. As for the liner being removable, Pu et al. discloses that the liner is removable. Furthermore, motivation was provided previously for forming a passage in the surfaces exposed to the gases (plasma) within the chamber.

With respect to claims 36-37, it should be noted that the Pu et al. reference does disclose a center member having an inlet and an outlet adapted to circulate a fluid through the passage wherein the passage is fluidly isolated from the processing volume. Furthermore, with respect to the cylindrical section and the center member comprising a single piece structure (claim 36), it should be noted that making elements integral was held to have been obvious, and such limitation would not lend patentability to the instant application absent the showing of unexpected results.

Concerning claim 4, applicant argues that the Pu et al., Masuda et al. and Collins et al. references fail to show or render unobvious the limitation of "a magnet disposed in the inner wall". The examiner respectfully submits that a broad reasonable interpretation of the meaning of "inner wall" is clearly met by the Collins '953 reference. Regarding the fact that Collins '953 fails to teach a magnet disposed within the inner liner, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988

F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Collins into the Pu et al. and Masuda et al. references is, for example, in order to confine the plasma thereby attaining better controllability. Additionally, there is clearly support for claim 19 because in Collins the magnets are located near the pumping port to confine the plasma (see fig. 1) and in fig. 1 of Pu et al. the region near the pumping port has lips extending into the processing chamber so it would have been obvious to modify the apparatus of Pu et al. to insert the magnets in this lip portion.

With respect to rejections involving the Pu et al., Masuda et al. and Reimold references, and the rejections involving Pu et al., Masuda et al. and Banholzer references, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Additionally, and with respect to the rejection of claim 24 using the Banholzer reference in conjunction with Pu et al. and Masuda et al., applicant argues that Pu et al. and Banholzer teach away from each other. However, this

analysis appears to be inaccurate because the fact that particles do or do not adhere to the exposed portions appears to be more of a result of an intended use of the apparatus than a structural limitation and it is not clear where Pu et al. discourages or teaches the prevention of particles depositing on the exposed portions.

Applicant argues with respect to claims 7-10, and 38-39, that the combination of Pu et al. with Shan et al. is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues with respect to claims 1-3 and 5 that the combination of Pu et al. and Lee is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Moreover, the secondary reference of Lee provides motivation to modify Pu et al. so as to control the temperatures exposed to the gases (plasma).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Pu et al. or Lee do not teach, show or suggest preventing deposition on the substrate support) are not recited in the rejected claim(s). Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Concerning claims 11-12, 14-17, and 20-23, applicant argues that both Pu et al. and Lee fail to suggest a chamber liner adapted to be removably disposed in a processing region and having a base for substantially covering the bottom of the processing chamber and a passage formed at least partially in the base. As for the liner being removable, Pu et al. liner is removable. Furthermore, motivation was provided previously for forming a passage in the surfaces exposed to the gases (plasma) within the chamber.

Regarding applicant's argument that Pu et al. or Lee do not teach, show or suggest a chamber liner having an annular base for substantially covering the bottom of the processing chamber, it should be noted that, as stated in the rejection, the primary reference of Pu et al. does disclose an annular base.

Concerning claim 4, applicant argues that the references fail to show or render unobvious the limitation of "a magnet disposed in the inner wall". The examiner respectfully submits that a broad reasonable interpretation of the meaning of "inner wall" is clearly met by the Collins '953 reference. Regarding the fact that Collins '953 fails to teach a magnet disposed within the inner liner, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Collins into the Pu et al. and Lee references is, for example, in order to confine the plasma thereby attaining better controllability. Additionally, there is clearly support for claim 19 because in Collins the magnets are located near the pumping port to confine the plasma (see fig. 1) and in fig. 1 of Pu et al. the region near the pumping port has lips extending into the processing chamber so it would have been obvious to modify the apparatus of Pu et al. to insert the magnets in this lip portion.

With respect to rejections involving the Pu et al., Lee et al. and Reimold et al. references, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Concerning the rejection of claim 24 using the Pu et al., Lee et al. and Banholzer references, applicant argues that Banholzer teaches away from the Lee reference. However, the Lee reference is relied upon to show temperature control of the portions of the liner exposed to the plasma and therefore the rejection is still proper.

Applicant argues with respect to claims 7-10, and 38-39, that the combination of Pu et al. with Masuda et al. is improper. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Luz L. Alejandro', written in a cursive style.

Luz L. Alejandro  
Primary Examiner  
Art Unit 1763

May 5, 2004